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Science Response 2014/039

Maritimes Region

ASSESSMENT UPDATE OF BROWNS BANK NORTH SCALLOPS (*PLACOPECTEN MAGELLANICUS*)

Context

A meeting of the Maritimes Science Advisory Process was held 1 May 2013 at the Bedford Institute of Oceanography (BIO), in Dartmouth, Nova Scotia to assess the status of the scallop stock on Browns Bank North in support of the management of the 2013 fishery (DFO 2013). Participants included DFO scientists, fishery managers, Aboriginal organizations, and industry.

The main scallop fishery on Browns Bank is conducted on the northern part of the bank. Browns Bank South is a marginal growth area for scallops and has separate management measures. The purpose of this report is to update the key results from the previous assessment with data from 2013 in order to provide science advice for the management of the 2014 fishery. The assessment and advice presented in this document use the assessment framework established in 2011 (Hubley et al. 2011) and updated in 2013 (DFO 2013), Browns Bank North.

This Science Response reports results from the Science Response Process of 6 May 2014 on the Offshore Scallops Stock Status Update.

Analysis and Response

The 2013 total allowable catch (TAC) was 750 t for Browns Bank North and total reported landings were 748 t. Based upon preliminary analysis of the 2013 fishery data and the annual stock survey data, an interim TAC of 750 t was set for the 2014 Browns Bank North fishery.

Science advice is provided for this stock using a modified delay-difference model that integrates both fishery and survey data and is described in Hubley et al. (2013). Estimates of fully-recruited biomass in 2013 and projections of fully-recruited biomass for 2014 under various TAC scenarios are presented for this stock.

Fully recruited biomass, estimated to be 5,912 t in 2013, is similar to the 2012 estimate (5,858 t) and is just below the 22-year median biomass of 6,762 t (Figure 1). Recruit biomass, estimated to be 206 t in 2013, declined from the 2012 estimate (887 t) and is below the 22-year median biomass of 590 t. The model's forecast for 2014 biomass is 6,028 t, assuming a catch of 750 t (the interim TAC), no change in condition, and natural mortality rates similar to 2013. This represents a 1 % increase in biomass from 2013.

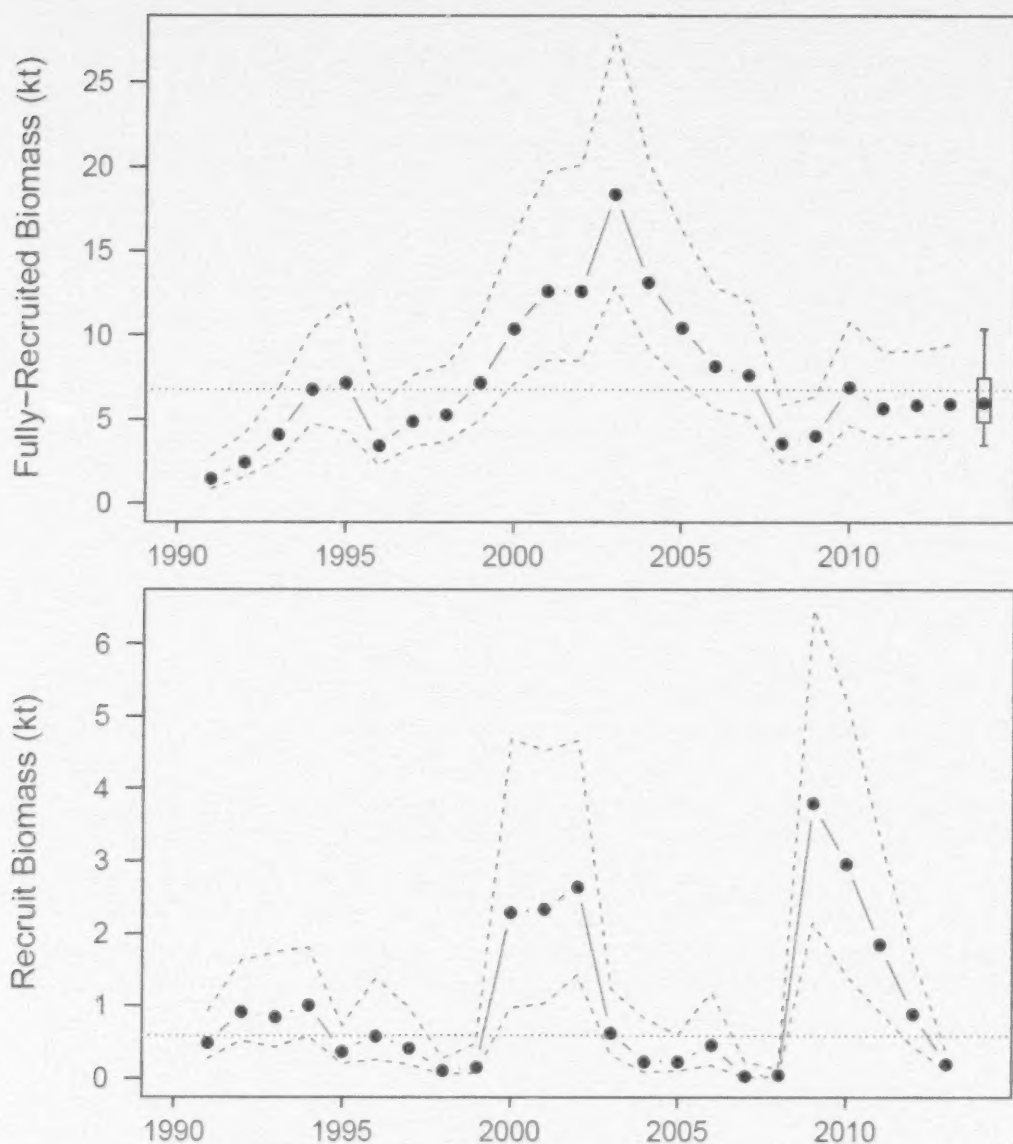


Figure 1. Biomass estimates for recruit and fully recruited scallops from the stock assessment model fit to the Browns Bank North survey and commercial data. Dashed lines are the upper and lower 95% credible limits on the estimates. The dotted line represents the 22-year median. The forecasted fully recruited biomass for 2014, assuming a catch of 750 t, is displayed as a box plot with median (•), 50% credible limits (box) and 80% credible limits (whiskers).

Conclusions

An interim TAC of 750 t would result in an exploitation rate of 0.12 for 2014, and biomass is expected to remain relatively stable (Table 1). Harvest scenarios ranging from 200 t to 1000 t were examined and all had moderate (0.38-0.55) probability of decline in commercial biomass for 2014. Biomass change ranged from 10 to -5 % for the range of catches considered here (Table 1).

Table 1. Harvest scenarios for Browns Bank North in 2014 in terms of exploitation and expected changes in fully-recruited biomass. Potential catches in 2014 are evaluated in terms of the probability of a decline in biomass. These probabilities account for uncertainty in the biomass forecasts.

Catch (t)	Exploitation Rate	Probability of Biomass Decline	Expected Change in Biomass (%)
200	0.04	0.38	10.41
300	0.06	0.39	9.56
400	0.07	0.42	7.33
500	0.09	0.44	5.14
600	0.10	0.46	3.53
700	0.11	0.48	1.57
750	0.12	0.49	1.00
800	0.13	0.51	-0.45
900	0.14	0.53	-2.48
1000	0.16	0.55	-4.53

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Sources of Information

- DFO. 2013. Assessment of Browns Bank North Scallops (*Placopecten magellanicus*). DFO Can. Sci. Advis. Sec. Sci. Advis. Rep. 2013/059.
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